

GTP for Single Phase meter under Tender Specification CSO/10/SPH Meter

| Tender Clause | Functions/ Features | Technical Requirements |
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| 4.01 | Accuracy | The meter should be of class 1.0 accuracy as per IS: 13779 or IEC -1036 or better |
| 4.02 | Voltage | 240 V – Phase to Neutral (Single Phase Two Wire System) |
| 4.03 | Rated Current | Rated basic current of the meters shall be 5 Amps. |
| 4.04 | Maximum Current | The rated maximum current for the meter shall be 30 Amps (600% Ib) at which the meter purports to meet accuracy requirement. |
| 4.05 | Power Factor range | Zero - lag - unity- zero lead |
| 4.06 | Power Supply Variation | The meter should be suitable for working with following supply system variations without damage and without degradation of its metrological characteristics. 4.6.1. Voltage: -40% to +20% Vref 4.6.2. Frequency: ± 5% (47.5 Hz to 52.5 Hz) |
| 4.07 | Power Consumption | 4.7.1. Voltage Circuit: Less than 1 Watt & 4VA in Voltage circuit. 4.7.2. Current Circuit: Shall not exceed 2 VA. |
| 4.08 | Starting current | The meter should start registering the energy at 0.2% of basic current. |
| 4.09 | Type of Service | The meter shall be suitable for use on Single phase two wire system. The connection diagram for the system shall be provided on the terminal cover. |
| 5 | Display | 5.01 The size of display shall be minimum 10 mm (Height) x 6 mm (Width).The display unit shall be Pin type built in liquid crystal display.The information shall be shown by an electronic display. 5.02 The register shall have minimum 6 digits. The KWH Parameters shall be displayed without decimal digits. The size of digit shall be 8mm x 5 mm (minimum). 5.03 The LCD shall have viewing angle min. 160 degrees.The display visibility should be sufficient to read the meter mounted at the height of 0.5 meters as well as height of 2 meters. 5.04 The electronic display of parameter need not be visible, when meter is not energized. |
| 6 | Display Parameter | a)LCD test, KWH, MD in KW, Date & Time (Cumulative KWH will be indicated continuously by default & other parameters through push-button) b) Display order shall be as per Annexure -1 |

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| 7 | Test Output Device | <p>7.01 The meters shall have a suitable test output device for testing of meter.</p> <p>7.02 The blinking LED or other similar device shall be provided.</p> <p>7.03 Test output should also work as operating indicator for meter.</p> <p>7.04 This device should be suitable for use with sensing probe used with test benches or reference standards. It shall be possible to capture the output from distance when the meter is housed in a box.</p> <p>7.05 The test output device should have constant pulse rate i.e. impulse / kWh and its value (meter constant) should be indelibly printed on the rating plate.</p> |
| 8 | Billing data | <p>8.01 Meter serial number, Date and time, KWH, MD in KW, History of KWH, & MD for last 6 months.</p> <p>8.02 All the above parameters (namely KWH, MD in KW) are meter readings.</p> <p>8.03 All these data shall be accessible for reading, recording and spot billing by downloading through Opticalport on universal MRI or Laptop computers at site.</p> |
| 9 | MD Registration (KW) | Meter shall store MD in every 30 min. period along with date & time. At the end of every 30 min, new MD shall be previous MD and store whichever is higher and the same shall be displayed. |
| 10 | Auto Reset of MD | Auto reset date for MD shall be indicated at the time of finalizing GTP and provision shall be made to change MD reset date through MRI even after installation of meter on site. Default resetting date is 00:00 hrs, 1st of every month. |
| 11 | TOD metering | Meter shall be capable doing TOD metering for KWH and MD in KW with 6 time zones (Programmable at site through CMRI) |
| 12 | Security feature | Programmable facility to restrict the access to the information recorded at different security level such as read communication, communication writes etc. |
| 13 | Memory | Non volatile memory independent of battery backup, memory should be retained up to 10 year in case of power failure |
| 14 | Software & Communication compatibility | <p>14.01 Optical port to transfer the data locally through CMRI or lap top.</p> <p>14.02 The Supplier shall supply Software required for CMRI. The supplier shall also provide training for the use of software. The software should be compatible to Microsoft Windows systems (Windows 98 system).</p> <p>14.03 The Supplier shall provide meter reading protocols. Vendor to jointly work with Discom IT team to develop PDS/CMRI software for meter downloading and further uploading on computer. The vendor has to give an undertaking in this regards. Either Communication Protocol IEC 62056 /DLMS protocol is to be provided or the API for development of software is to be provided.</p> |

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| | Climatic conditions | 3.01 Refer IS: 13779 for climatic conditions. 3.02 Meters shall be capable of maintaining required accuracy under hot, tropical and dusty climate. 3.03 The meter should function satisfactorily in India with high end temperature as 60°C and humidity up to 96%. 3.04 The overall climatic condition is moderately hot and humid tropical climate, conducive to rust and fungus growth. |
| 15 | CONSTRUCTION SPECIFICATI | |
| | Parameters | Technical Requirements |
| 15.01 | Body of Meter | a) Top transparent and base opaque material polycarbonate UV stabilized. b) Front cover & base should be ultrasonically welded. Top cover should be designed so as the internal components should not be visible. Front cover and base to be ultrasonically welded such that it shall not be opened without breaking the enclosure. |
| 15.02 | Terminal Block | Made of polycarbonate Grade 500R or equivalent bakelite, brass or copper current terminals with flat-head brass screws. |
| 15.03 | Terminal cover | Transparent terminal cover with provision of sealing through sealing screws |
| 15.04 | Diagram of connections | Diagram of external connections to be shown on terminal cover |
| 15.05 | Marking on name plates | Meter should have clearly visible, indelible and distinctly name plate marked in accordance with IS & DISCOM specifications. Prior approval of name plate design to be taken before product supply. |
| 15.06 | Meter Sealing | Supplier shall affix one Buyer seal on side of Meter body as advised and record should be forwarded to Buyer. Sealing shall be as per IS 13779 amendment and CEA guidelines. |
| 15.07 | Guarantee / Warranty | 5 Years |
| 15.08 | Insulation | A meter shall withstand an insulation test of 4 KV and impulse test at 8 KV |
| 15.09 | Resistance of heat and fire | The terminal block and meter case shall have safety against the spread of fire. The shall not be ignite by thermal overload of live parts in contact with them as per the relevant IS 13779 |
| 16 | Tamper & Anti Fraud Detection/Evidence Features | |
| 16.01 | Tamper Condition | Meter Behavior |
| 16.1.1 | I/C & O/G Interchanged | Meter should record forward energy |
| 16.1.2 | Phase & Neutral Interchanged | Meter should record forward energy |

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| 16.1.3 | I/C Neutral Disconnected, O/G Neutral & Load Connected To Earth | Meter should record forward energy |
| 16.1.4 | I/C Neutral Disconnected, O/G Neutral Connected To Earth Through Resistors & Load Connected to Earth | Meter should record forward energy |
| 16.1.5 | Neutral Connected To Earth | Meter should record forward energy |
| 16.1.6 | Disconnected load Connected to | Meter should record forward energy |
| 16.1.7 | I/C & O/G (Phase or Neutral) Disconnected, Load Connected to earth | Meter should record forward energy |
| | During neutral missing mode strating test will done at 1 A and accuracy shall be within 5% at IB and above | |
| 16.02 Influence Parameters | | |
| | | <p>The meter shall work satisfactorily with guaranteed accuracy limit under the presence of the following influence quantities as per IEC: 1036 and CBIP Technical Report No: 88 with latest amendment:</p> <p>16.2.1 External magnetic field *</p> <p>16.2.2 Electromagnetic field induction,</p> <p>16.2.3 Radio frequency interference,</p> <p>16.2.4 Vibration etc,</p> <p>16.2.5 Waveform 10% of 3rd harmonics,</p> <p>16.2.6 Voltage variation,</p> <p>16.2.7 Electro magnetic H.F. Field,</p> <p>16.2.8 D.C. immunity test,</p> |
| External magnetic field * test will be done as IS for AC abnormal field and at 0.5Tesla for DC magnetic field. | | |

| 19.0 COMPONENT SPECIFICATIONS | | | Makes and Origin |
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| 19.01 | Current Transformers/Shunt | The Meters should be with the current transformers / shunt as measurement elements. | The current transformer/ Shunt should withstand for the clauses under 16.2.8 |
| 19.02 | Measurment or computing chips | The measurement or computing chips used in the meter should be with surface mount type with the ASICs | USA: Analog Devices, Cyrus Logic, Atmel, Phillips,TDK,TI South Africa: SAMES Japan: NEC |
| 19.03 | Momory Chips | The memory chips should not be affected by the external parameters like sparking high voltage spikes or electrostatic discharges. | USA: Atmel, National Semiconductors, Texas Instruments, Phillips, ST,Japan: Hitachi or Oki |
| 19.04 | Display modules | a) The display modules should be well protected from the external UV radiations. b)The display visibility should be sufficient to read the meter mounted at height of 0.5 meter as well as height of the 2 meters (refer 3.2 d for viewing angle) c)The construction of the modules should be such that the displayed quantity should not disturbed with the life of display (PIN Type). d) It should be trans-reflective HTN or STN type industrial grade with extended temperature range. | <u>Hong Kong: Genda, Singapore: Bonafied Technologies Korea: Advantek China: Success,China display Japan: Hitachi, Sony</u> |
| 19.05 | Communication modules | Communication modules | USA: National Semiconductors, HP, Optonica <u>Holland / Korea: Phillips</u> Japan: <u>Hitachi</u> Taiwan: <u>Ligitek</u> |
| 19.06 | Optical port | The mechanical constrution of the port should be such to facilitate the data trasfer easily. | USA: National Semiconductors ,HP <u>Holland / Korea: Phillips</u> Japan: <u>Hitachi</u> Taiwan: <u>Ligitek</u> |
| 19.07 | Power supply | The power supply should be with the capbilities as per the relevant standards. The poower supply unit of the meter should not be effected in case maximum voltage of the system appears to the terminals due to faults or due to wrong connections. | <u>It should take care of clause 4.6 and 4.7</u> <u>Preferably SMPS</u> |
| 19.08 | Electronic components | The active and passive components should be of the surface mount type & are to be handled & soldered by the state of art assembly processes. | USA: National Semiconductors, Atmel, Phillips, <u>Texas Instruments,</u> Japan: <u>Hitachi, Oki, AVX or Ricoh</u> <u>Korea: Samsung</u> Taiwan: Yageo; samxon |
| 19.09 | Mechanical parts | a) The internal electrical components should be of electrolytic copper & should be protected from corrosion ,rust etc. b) The other mechanical components should be protected from rust, corrosion etc. by suitable plating/painting methods | |
| 19.1 | Battery | Lithium with guaranteed life of 10 years | Varta, Tedirun, Sanyo or Panasonic, maxwell |
| 19.11 | RTC & Micro controller | The accuracy of RTC shall be as per relevent IEC / standards | USA: Philips, Dallas Atmel, Motorola, Microchip Japan: NEC or Oki |

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| 19.12 | P.C.B | Glass Epoxy , fire resistance grade FR4, with minimum thickness 1.6 mm. | <u>(BBT test is must)</u> |
| Note : The components used by manufacturer shall have “Minimum Life” more than the product “Guarantee life” as mentioned in cl 15.07. This hold true even for name plate printing, mechanical component plating, glue of stickers etc. Incase vendor want to use other make components; same shall be approved by CSO before use. In general the component life shall be twice the “Guarantee life”. | | | |
| 20 | Additional Features | <p>20.01 Construction: The meter shall have top cover opening detection mechanism. The top cover opening event shall be available in the form of a display in push button mode. The detection mechanism shall be available even if the meter is not energized.</p> <p>20.02 Power ON/OFF hrs: Along with billing history parameters, meter shall log monthly ON/OFF hrs as history</p> <p>20.03 Tamper logging: Last 10 events of magnetic tamper, single wire tamper and top cover tamper shall be logged in the memory along with occurrence and restoration event data</p> <p>20.04 Instantaneous load in kW, current and billing power factor on the display should be available in push button mode.*Billing Power Factor and Current is optional</p> <p>20.05 Protection against HV spark: The meter shall continue to record energy or log the event, in case it is disturbed externally using a 35kV spark gun/ignition coil.</p> | |
| 21 | General Requirements | <p>21. On the meter name-plate:</p> <p>21.1.1 Meter serial number should be of 7/8 digits</p> <p>21.1.2 Size of the digit of the meter serial number should be minimum 4mm X 3mm.</p> <p>21.1.3 Bar code should be printed next to / below / above the meter serial number</p> <p>21.1.4 BIS registration mark (ISI mark)</p> <p>21.02 Meter Sr. Nos. to be printed in black on the name plate, instead of embossing.</p> <p>21.03 Buyer’s Serial Number sticker should be fixed on window glass from inside or on Meter front cover of minimum digit size 5 mm X 3 mm.</p> <p>21.04 Supplier shall supply software suitable for energy measurement & energy spot billing through CMRI.</p> <p>21.05 The supplier should seal the meter cover. The Buyer shall approve the method of sealing.</p> <p>21.06 The internal potential links should be in closed position or link less Meters will be preferred and there shall not be any external link.</p> <p>21.07 Terminal cover should be fixed on Meter before dispatch.</p> <p>21.08 Box number, Meter serial number, type, rating should be mentioned on cases / cartons.</p> <p>21.09 Meters shall be suitably packed with environmental friendly material in order to avoid damage or disturbance during transit or handling and to prevent in grace of moisture and dust.</p> | |